Regional and Mesoscale Models Nested in a Global Model:
Dynamics and Boundary Conditions

Gallacher, P. C., M. R. Schaferkotter and S. Piacsek

Regional and mesoscale models are being used to study various aspects of Coastal Oceanography. We are using a regional model of the MidAtlantic Bight with an embedded mesoscale model of the New Jersey shelf/slope to study the outer shelf dynamics, particularly the internal wave field, and it's effect on acoustical propagation. The results of several simulations with different forcing and boundary conditions will be discussed. The results will be compared with data from the SWAT experiment and with tide gauges.

Both the regional and the mesoscale models are set up using the Navy Coastal Ocean Model (NCOM). NCOM is designed for efficient nesting with the capability of one- or two-way nesting. The effects of remote forcing are included through active open boundary conditions. These boundary conditions prescribe the temperature, salinity and velocity fields from the Global version of NCOM and tidal amplitude and phase from the ADCIRC model. The boundary conditions also allow for the radiation and advection of temperature, salinity and velocity out of the domains. Surface fluxes are taken from Coupled Ocean and Atmosphere Prediction System (COAMPS) forecasts.